THE INDUSTRIAL DEVELOPMENT OF PALESTINE

BY

N. WILBUSCHEWITSCH

TRANSLATED BY
EDEN AND CEDAR PAUL

2/6 net.

TRADE AND INDUSTRY DEPARTMENT OF THE CENTRAL BUREAU
OF THE ZIONIST ORGANISATION (LONDON)

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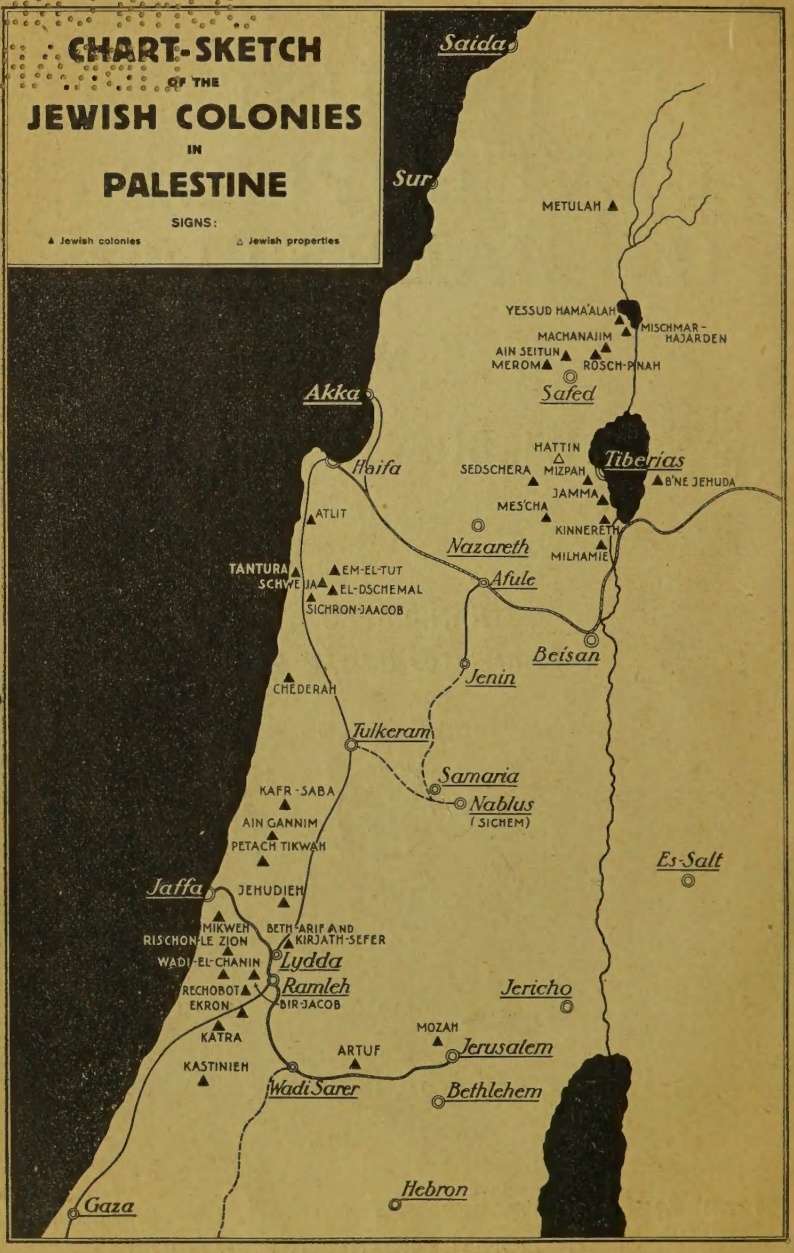
CHART-SKETCH
OF THE
JEWISH COLONIES
IN
PALESTINE
SIGNS:
▲ Jewish colonies
△ Jewish properties
Saida
Sur
METULAH ▲
YESSUD HAMA'ALAH ▲
MISCHMAR-HAJARDEN
MACHANAJIM ▲
AIN SEITUN ▲
MEROM ▲
ROSCH-PINAH
Safed
Akka
HATTIN △
Tiberias
SEDSCHERA ▲
MIZPAH ▲
B'NE JEHUDA ▲
JAMMA ▲
Haifa
ATLIT ▲
MES'CHA ▲
KINNERETH ▲
MILHAMIE ▲
Nazareth
TANTURA ▲
SCHWEJA ▲
EM-EL-TUT ▲
EL-DSCHEMAL ▲
SICHRON-JAACOB
Afule
Beisan
Jenin
CHEDERAH ▲
Tulkeram
Samaria
KAFR-SABA ▲
Nablus
(SICHEM)
AIN GANNIM ▲
PETACH TIKWAH ▲
Es-Salt
Jaffa
JEHUDIEH ▲
MIKWEH RISCHON-LE ZION ▲
BETH-ARIF AND KIRJATH-SEFER ▲
WADI-EL-CHANIN ▲
Lydda
RECHOBOT ▲
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Ramleh
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CHAPTER I.

INTRODUCTORY

Under the Turkish regime manufacturing industry was but little developed in Syria. Above all was this true of Palestine, the southern portion of Syria. Such industries as existed were mainly home industries and handicrafts, for factories on the European scale were rare. Before the war, the total products of Syrian industry and handicraft (including those of Palestine) were estimated at approximately one hundred million francs per annum. This sum represented about 11 % of the total-income from all sources and was comprised of the following items

	in round figures frs.
Mining industry (quarring for the most part), fisheries (maritime and in the inland waters)	10,000,000
Large-scale manufactures (textiles, oils, mills, tanneries, wines etc.)	30,000,000
Home industries and handicrafts	30,000,000
Communications (railways, coastal transport, harbours and railway stations, high roads, posts and telegraphs)	30,000,000

The total annual value of the products of agriculture and of agricultural by-products was estimated at seven hundred million francs comprising about 80 % of the total income.

The development of industry and commerce was hindered by political conditions, such as the restrictions imposed by the capitulations, defective legislation, and inadequate transport facilities. The main source of trouble, however, was the venality and arbitrariness of the officials, in conjunction with the widespread poverty, lack of education, and low standard of living of a population mainly agricultural and making little demand for the products of manufacturing industry. Additional causes were the paucity of available mineral wealth, lack of capital, and deficient spirit of enterprise. The total imports of Syria and Palestine, with

a population of three and a half millions, amounted to nearly frs. 150,000,000 per annum, this sum being made up as follows:

Products	Value in round figures	Value per head of population
	frs.	frs.
Textiles	70,000,000	20
Other manufactured articles . .	60,000,000	17
Flour and other agricultural produce	20,000,000	6

The imports by way of Jaffa for southern Palestine with a population of half a million amounted to nearly a quarter of the total imports. It follows that for Palestine the annual imports amounted to seventy francs per head of population, whereas for the rest of Syria the figure was only forty francs per head. The reason for this difference is partly to be found in the more extensive requirements of the urban population of Palestine, consisting largely of Jews and foreigners. An additional reason is that manufacturing industry is less developed in Palestine than in northern Syria, where textiles and other branches of industry flourish, so that the needs of the population are to a large extent supplied by local products and imports are superfluous.

Now that the war is over, the change in political conditions will, doubtless, bring about increased wellbeing, and, as a result of this, industry and commerce will thrive.

It is impossible, as yet, to foretell how and with what speed manufacturing industry will develop in Palestine; it is impossible to foresee which branches of industry will flourish most abundantly. We must first know how the various Syrian provinces are to be grouped politically; we must know how Palestine is to be linked with Egypt and her other neighbours; we must be informed regarding the future status of these adjacent countries and regarding their mutual relationships.

This much is certain. The first essential to the growth of every manufacturing industry is that there should be a market for the wares; the next requisite is the technical capacity for the production of goods which can challenge competition with those imported from other lands. Now as far as most branches of industry are concerned, the market of Palestine is too small to justify the installation in that country of modern large-scale factories. On the other hand, the standard of life of the Jewish working class is too high for the persistence of home industry

as hitherto carried on in this region, with low wages and primitive working conditions. If manufactures are to be established in Palestine at all, a wider market must be found for the commodities thus produced, and this market will for the most part be confined to the east. Advantage must be taken of the position of the country as one of the nodal points of the Old World. The example of the ancient Phœnicians must be followed. During their prolonged exile the Jews have taken over the heritage of Phœnicia and have played a leading part in world commerce. It may be hoped that the new Jewish imigration may bring to all the eastern countries adjoining Palestine fresh Jewish settlements containing traders, technicians and craftsmen. We may further anticipate that these will maintain communications with Palestine as a metropolitan centre, and that the newcomers will induce the earlier Jewish settlers in the east to open up relations with their brethren in Palestine. The Jewish settlers in the east can play the part played by the Phœnician colonists of old; through their activities the manufactures of Palestine may be diffused throughout the orient and indeed throughout the world; by thus opening access to the world market, they can contribute greatly to the growth of industry in Palestine.

It may here be pointed out that one of the most important prerequisites for the development of manufacturing industry in Palestine is that Transjordania should remain attached to western Palestine. Eastward of the Jordan lie extensive and fertile plains, potentially fertile though now little better than deserts, and there are also hill regions eminently susceptible of afforestation. In the lands eastward and southward from the Dead Sea there are mineral riches and these, in conjunction with the water power which can be obtained from the eastern rivers, are of prime importance to the development of industry in Palestine. By direct communication with Akabah, transport would be notably cheapened, facilitating the import of raw materials from India and the far east. The need for paying heavy freights through the Suez Canal being thus obviated, trade with Arabia and India would be greatly encouraged. We have further to remember the trade with the Bedouins, from whom Palestine buys cattle, camels, wool, butter, hides, etc. to the annual value of from ten to twenty million francs. In return, Palestine supplies the Bedouins with cereals, tobacco, sugar and other groceries, textiles, arms and ammunition, etc. This exchange of goods is of great importance to the industry and commerce of Palestine. Along the Bedouin routes, therefore, on the margin of the desert,

great trading centres must be founded, able to take over, in part at least, the commerce of Syria, that of Damascus, Homs, Hamah and Aleppo.

The following preconditions are assumed in the subjoined attempt to forecast the industrial development of Palestine:

1. Within is natural frontiers, as far north as Lebanon (Litani) and the Damascus region (Nahr-el-Aujeh) in the north, and as far as the uninhabited desert in the east and the south, Palestine will constitute a single and indivisible area. Under British suzerainty, it will maintain intimate relationships with Syria and with the adjacent British colonies, Egypt, Mesopotamia, and Arabia.

2. Under British suzerainty, Palestine will enjoy just and strict laws, whereby the rights of individuals will be safeguarded and protection will be afforded against arbitrary conduct on the part of officials and the administration.

3. It is further assumed that the restrictions imposed by the capitulations will be annulled, that import dues will be abolished, and that Palestine will be thrown open to free competition in conjunction with Syria, Egypt, Arabia and Mesopotamia.

4. Special legislation on behalf of the Jews will favour these in respect of colonisation and in respect of the development of agriculture and manufacturing industry.

5. The Jewish settlement of Palestine will be effected in accordance with an intelligent design, and with as few mistakes as possible. There must be no grave deficiency either of capital or labour power.

6. During the ensuing twenty to twenty-five years the population of Palestine will be supplemented by the influx of a million or so of Jews. In intelligence, cultural development, and standard of live, these must be on a par with the inhabitants of western Europe. Their chief occupations must be manufacturing industry and agriculture.

If these preconditions be fulfilled, the natural advantages of the region are such as to justify the sketch to be given in the sequel. Granted these requirements, the industry and commerce of Palestine will develop in a manner well suited to the natural conditions of the country and to the extent of population it is competent to support. The results will then be all that can be desired for the land and its inhabitants.

Fig. 1

Fig. 1

AN ARABIAN LIME KILN

Charge about 12 000 kilogr. of lime; consumption of fuel more than 100 % of brushwood; labour requisite forty working days; (from the author's **Materialien zur Entwicklung der Industrie in Palästina und Syrien).**

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Fig. 2

CAVE WITH STALACTITES IN JEBEL-USDUM

(Mount Sodom)

This mountain, situated upon the south-western shore of the Dead Sea, is about eleven km. long and one and a half km. wide. It consists mainly of gypsum, but contains a layer of rock salt fifty metres in depth and varying in purity from 98 % to 99 1/2 %.

o

Fig. 2

Fig. 3

Fig. 3

THE MAKING OF GUNPOWDER IN A CAVE NEAR BET-JIBRIN

In this manufacture sulphur from the lower part of the Jordan is employed.

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Fig. 4

NEBY-MÚSA

(Burial place of Moses)

Mohammedan place of pilgrimage about 20 kilometres to the east of Jerusalem. Close at hand is an extensive deposit of the richest bituminous lime in Palestine, its percentage composition being, in round figures: pure bitumen 20 %; calcium carbonate 70 %; clay 5 %; ferric oxide 5 %; (op. cit.)

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Fig. 4

CHAPTER II.

THE MINING INDUSTRY

Before the war a number of plans had been put forward for the utilisation of the mineral wealth of Palestine, but hardly any mining operations had actually been undertaken. In the first place, most of the mineral treasures of Palestine are little suited for export as raw material. In the second place, the development of the mining industry was greatly hampered by the internal political situation and by the granting of monopolies, the minerals of the Dead Sea region being allotted to the Djiftlik, salt to the Dette Publique, phosphates to the Hedjaz railway.

Throughout the Turkish empire the mining industry was but little developed. For the year 1908 the entire output of the country's mines was estimated at £2,230,000, approximately 55 % of this sum representing salt, and approximately 17 % representing coal. In area, Syria comprised about 15 % of the empire, but its share in the total mining output was barely 3½ %. During the war, attempts were made to exploit the minerals of Syria. In Lebanon for instance, coal was mined, as much as fifty tons daily being produced; in the Yarmuk valley mineral oil was extracted from the bituminous lime of Naharin and was used as a lubricant on the Hedjaz railway but the quantities obtained were insignificant. No adequate attempts were made to utilise the underground wealth of the country.

For the purposes of this essay the mineral treasures of Palestine may be classified as follows:

1. QUARRY-STONE. Hitherto this has been the principal object of the local mining industry. Good building stone is obtainable almost anywhere. Limestone and dolomite in the mountain regions; calcareous sandstone on the coast; basalt at Tiberias and in Hauran. During the days of classical antiquity the Syrian stone industry was highly developed but has now fallen into decay. In view of the great number of new buildings likely to be erected and in order to provide employment for Jewish workmen, it is of the utmost importance that the industry should be modernised, that up to-date methods should be adopted, that new machinery and tools should be employed. Thus only can good building stone be produced at a reasonable price, and thus only can occupation be provided for many thousands.

By the use of modern machinery too, excellent paving stone could be secured from the rough natural slabs found at Jásim near Jerusalem. This might prove a lucrative industry.

2. LIME is found everywhere in large quantities and of good quality. At the present time it is utilised solely for the production of the quicklime needed for building, the lime being burned for the most part in simple charcoal kilns, though of late to some extent in continuous pit-kilns. Hydraulic lime and cement have not as yet been produced, but could be manufactured from the existing supplies of lime and clay, and could be utilised not only in Syria but for export to countries near at hand. Preliminary experiments have shown that there is quite a number of limes and marls well suited for this manufacture.

3. GYPSUM is produced in small quantities near Damascus. There are deposits of good gypsum at Jebel-Usdum; and gypsum of even better quality is found at Jebel-Gipsin, near Melhamia. With improved transport facilitates it would be possible to obtain gypsum from both these places. There can be little doubt that the growth of the building industry in Palestine will call for a large output of native gypsum.

4. SALT is found in Palestine in vast quantities. At Jebel-Usdum there is rock salt of a high standard of purity, 99 %. The waters of the Dead Sea, containing sodium chloride in concentrated solution (8 %), could furnish practically inexhaustible supplies of salt. Numerous salt springs are found upon the shores of this sea and in the southern end of the Jordan valley. Westward from El-Arisch there are likewise to be found deposits of salt and these have been worked to some extent during the war.

Salt is one of the monopolies of the Dette Publique. Owing to the difficulties of transport and the high cost of freightage hardly any salt is worked in Palestine and very little in Syria. In the vilayets of Beyrout and Damascus and in the mutessariflik of Jerusalem the Beyrout administration sells yearly thirteen thousand five hundred tons of salt to the value of frs. 2,000,000. This represents an annual consumption of 5.4 kilogrammes per head of population, the cost being fifty centimes per head. The consumption per head in Germany is about 18 kilogrammes and in England 37 kilogrammes (as far as England is concerned the dietetic consumption of salt amounts to 7.8 kilogrammes per head, the balance being used in cattle feeding and for industrial purposes). The salt used in Palestine comes for the most part from Asia Minor.

The degree to which Palestinian salt can be exploited will depend upon the provision of cheaper transport facilities to the Dead Sea region and upon the growth of the chemical industry of the country. Salt will be widely employed in the feeding of cattle, in the manufacture of soda, in salting fish, in soap making, the leather industry, the manufacture of glass, as an ingredient of manures, etc. The Dette Publique used to export large quantities of salt, from seventy-five thousand to one hundred and ten thousand tons, being procured from Asia Minor and sent annually to India.

5. CARNALLITE is contained in enormous quantities in the waters of the Dead Sea. Crude carnallite, obtained by crystallisation, is said to contain 26 % of potassium chloride, whereas the crude carnallite from the Stassfurt mines contain only 16 %. The potassium chloride extracted from carnallite, varying in purity from 85 % to 99 %, forms an ingredient of artificial manures, is used in the manufacture of potash and saltpetre, nitric acid, gunpowder and other explosives, soap, and glass, large quantities being utilised for these purposes. Owing to the high temperature which constantly prevails on the shores of the Dead Sea, the production of crude carnallite is easy and inexpensive, seeing that no fuel is required. The possibilities of its purification and export will depend upon improved transport and upon the general development of native industry. As an ingredient of manures, carnallite would be a valuable addition to the soil in many parts of Palestine.

6. BROMINE, in the form of magnesium bromide, can easily be extracted from the waters of the Dead Sea. The lye that remains after crystallisation has been effected contains from 1.2% to 1.3% of bromine. At Stassfurt, bromine is extracted from lye containing no more than 0.2 %. Bromine is a most valuable product, suitable for export.

7. SULPHUR is found in the lower end of the Jordan valley and in the environs of the Dead Sea. For the most part it is met with in lumps, some of which are pure sulphur, whilst others may contain as much as 65% to 80% of sulphur, but average samples show a sulphur content ranging from 30 % to 35 %. Although the sulphur deposits are not extensive, there is enough of the mineral to supply local needs, and the sulphur can be used in the manufacture of sulphuric acid and of carbon bisulphide (used as a solvent).

8. PHOSPHATES are found to the east of Salt, the crude mineral containing from 50 % to 70 % of calcium phosphate.

The deposits are supposed to total one hundred and fifty thousand tons. The right of exploitation belongs to the Hedjaz railway. The deposit being scanty and its situation remote the prospect of profitable extraction has been small, so that for various reasons little work has hitherto been done. These phosphates from the east of Jordan and also those from the desert regions of Judea (containing from 40 % to 50 % of calcium phosphate) could be utilised in Palestine for manuring purposes, thus greatly promoting the development of agriculture.

9. ASPHALT. There is not much asphalt in Palestine, but what there is is of good quality. Professor Blankenhorn declares that in the floor of the Dead Sea there is a fissure containing pure asphalt. The quantity of asphalt practically obtainable in the vicinity of the Dead Sea is estimated at several thousand cubic metres. More tho the northward are the asphalt deposits of Hasbeiya, the mineral being found here in larger quantities, but of inferior quality. Between 1895 and 1900, asphalt was mined at Hasbeiya at a depth of about twenty metres, the annual product being from three hundred to six hundred tons. Owing to its excellent quality and high price, Palestinian asphalt has hitherto been employed solely in the manufacture of pigments and varnishes, and might contribute powerfully to the local development of the respective industries. The native asphalt is less suitable for road making and flooring purposes. In Transjordania, between Ziza and Daba, and elsewhere, deposits of pure asphalt are found.

10. BITUMINOUS LIMES are found for the most part in the lateral valleys eastward of the Jordan, but also in various parts of western Palestine and Transjordania. This mineral occurs in inexhaustible quantities, but the average content of bitumen is less than 10 %. The richest bituminous limes are those of Neby-Músa, containing from 10 % to 25 % of bitumen. The bituminous limes of Palestine are little suited for asphalt works, but can be used for the manufacture of mineral oil. Since fuel is scarce in Palestine, the plentiful supply of this mineral is of great importance. The manufacture of gas for heating and lighting purposes, bituminous lime being used as the raw material, might be successfully developed, especially in Jerusalem. The best method of treating the mineral and the possibility of securing valuable by-products have not yet been sufficiently studied, and the importance of the prospective manufacture renders it desirable that a thorough preliminary investigation should be undertaken without delay.

11. PETROLEUM. In all probability petroleum can be found in Palestine. It is even contended that the underground oil-fields of Palestine are most extensive and that they stretch along the entire valley of the Jordan and the Dead Sea region; but careful borings must be made before we can decide whether mineral oil is forthcoming in quantities which it would pay to work. Some experts declare that the mineral oil occurs only at a depth of from three hundred to five hundred metres. In Naharin the Syrian Exploration Company has made borings to a depth of one hundred and sixty metres, but these have have done little to clear up the problem as to whether workable deposits exist. This company, with a capital of £100,000, had a prospecting licence for the environs of Biria near Safed, for the Yarmuk valley, the Jabbok valley, Wady-el-Arab, and for the western littoral of the Dead Sea. The Standard Oil Company took over the licence from Ismail Bey el Husseni, Selim Ayoub and Soleiman Nassif. In the summer of 1914 it was about to undertake borings on a large scale in Kornub, seventy miles southward of Hebron, but the outbreak of the war put an end to the project. Experts maintain that the prospects of successful oil workings at the Kornub are considerably better than at Naharin.

Palestine is situated in the petroleum zone between Mesopotamia and Egypt. In Hit there are oil springs. In the south too, in the region anciently known as the land of Midian, petroleum is said to exist. Towards the end of 1913 an English company, the Midian Company Limited, was founded in order to work petroleum, pitchblende, and radium in this area, but has not yet commenced operations. In Egypt, close at hand, petroleum was found on the Golf of Suez at dephts of 1265 and 1635 feet. During the years 1912, 1913, 1914 and 1915 the yield of the Egyptian oilfields was respectively twenty-five thousand, fifteen thousand, one hundred and twenty-five thousand, and thirty-six thousand tons.

Before the war the annual consumption of petroleum in Palestine and Syria was about thirty thousand tons, this being approximately nine kilogrammes per head of population. Of this quantity southern Palestine consumed about 20 %, approximately fifteen kilogrammes per head of population. Should mineral oil be discovered in Palestine in quantities approaching those which Egypt can supply, it would notably contribute to the development of the country. The difficulties due to the scarcity of fuel would

be for the most part solved, and there would be a surplus of petroleum available for export.

12. OTHER MINERALS. In Rohr-el-Safi near Fenan there are remains of ancient copper mines and smelting works. Copper ore containing from 25 % to 40 % of copper is still obtainable in this region, but not, it would appear, in any considerable quantities. Alum has been found on the eastern shores of the Dead Sea. Chromium, boracite, and galena are said to occur, and amber is found in Lebanon. Ozokerite containing about 22 % of ceresin was first discovered in Lebanon near Behamdun during the year 1918 by Professor Kört in the bituminous deposits of that region. It is possible that a detailed investigation and elaborate boring experiments for the discovery of mineral treasures will disclose further deposits of ozokerite and other minerals in Palestine.

The above survey of the mining possibilities of the country will have shown that in the development of the native mining industry, more attention must be paid to the possibilities of consumption within the confines of Palestine than to possibilities for the export of raw materials. It follows that mining prospects are closely interconnected with the prospect of developing large-scale industries in which the Palestinian minerals can be utilised on the spot.

CHAPTER III.

LARGE-SCALE INDUSTRY
(carried on in power-driven factories)

By large-scale industry we denote those undertakings which require a great capital expenditure in comparision with the amount of labour employed, which produce commodities chiefly with the aid of machinery in place of hand labour, and which are conducted on ordinary capitalist lines — undertakings wherein management by cooperative societies or artels is hardly practicable. Among such industrial undertakings for which Palestinian conditions are suitable, the following may be enumerated: —

1. FLOUR MILLING. Western Palestine (and Judea in particular) has not hitherto produced sufficient wheat for the requirements of its population. Transjordania, on the other hand, grows a considerable surplus of wheat. The annual wheat production in Judea is seventy kilogrammes per head of population, whilst that in Transjordania is three hundred and fifty kilogrammes. The estimate of consumption of wheat, per head per annum, is: in Turkey 145 kilogrammes; in Greece 162 kilogrammes; in France 256 kilogrammes. Consequently it has been necessary to import European flour into Palestine. Between 1910 and 1913 the imports by way of Jaffa ranged from 3700 tons to 11,650 tons, and those by way of Haifa ranged from 670 tons to 2170 tons. Transjordania, on the other hand, exports wheat, sending it for the most part to Damascus and Lebanon, but despatching some of the grain abroad by the port of Haifa (the amount of grain thus exported by way of Haifa from 1909 to 1913 ranged from 5400 tons to 18,600 tons).

The mills in Palestine are of a simple type. In western Palestine we find about one hundred and thirty-five primitive water mills, and about one hundred and thirty mills driven by steam or other engines. Most of these latter are in the towns and are adapted for producing the finer kinds of flour.

In Transjordania there are about fifty primitive water mills and about forty mills of simple construction but driven by mechanical power. Large power-driven roller flour mills are found only in Damascus and Beyrout. Should better communication between Transjordania and Jerusalem be established, and should the future

development of agriculture lead to local production of sufficient quantities of wheat, a certain number of large roller mills could be successfully established in Palestine.

2. THE OLIVE OIL INDUSTRY flourishes in Palestine despite the primitive methods employed. In the villages there are olive oil mills to the number of about six hundred, and in two years the output of these mills has totalled something like seven thousand tons of oil, of an estimated value of frs. 7,000,000.

Nearly half of this oil finds a dietetic use, but the larger moiety is employed in the manufacture of soap. The quantity exported is trifling, amounting to barely one hundred tons. On the other hand a considerable quantity is imported for soap-making, as much as two thousand five hundred tons per year.

Of late years the fifty soap-factories of Palestine have produced as much as nine thousand tons of soap per annum. Of this, from six thousand to eight thousand tons, valued at from five to six and a half million francs, has been exported to Egypt by way of Jaffa. The production of sesame ranges from ten thousand to twenty thousand tons, and the export of this grain is from six thousand to twelve thousand tons per annum at an estimated value of from three million to six million francs. Other vegetable oils have no economic importance at present.

In Damascus the annual production of hemp-seed ranges from twelve hundred to fourteen hundred tons, the estimated value bein frs. 250,000. Part of this is exported by way of Beyrout.

In western and eastern Palestine four hundred tons of butter of the approximate value of frs. 1,000,000 are produced. Most of this butter, known locally as semne, is consumed in the country. The supply is supplemented by semne which the Bedouin Arabs bring in the spring time. The quantity thus supplied ranges annually from six hundred to two thousand tons and is valued at from one and a half million to five million francs. The extent of this import varies conversely with the richness of the local pasturage, and most of it goes to northern Syria, for eastern Palestine supplies its own needs. The greater part of the semne is adulterated by the addition of mutton fat, American margarine (imports about six hundred tons), and cocoa butter (imports about one hundred tons per annum). Semne is exported to Egypt and Turkey, five hundred tons being shipped via Beyrout, and from five hundred to one thousand tons via Alexandretta. The estimated value of this export is from three to four million francs.

Fig. 5

Fig. 5

ARAB WATERMILL

The mill-stones whose diameter ranges from 1 to 1.50 m. and whose thickness varies from 15 cm. to 20 cm. are made of lava at Leja in Hauran, near the Mahadja station on the Hedjaz railway. The turbines, driven by a flowing stream have an average mechanical efficiency of 20 %. The yield of such a mill is from 200 to 400 kg. per day.

In western Palestine there are about one hundred and thirty-five such mills, most of these being in Galilee; in Transjordania there are about fifty. (op. cit.)

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Fig. 6

OLIVE GROVE AT BETHLEHEM

The Palestinian olives contain from 20 % to 38 % of oil. The yield of the oil mills is from 12 % to 30 %. In Palestine there are about 600 oil mills. In good years the oil production of Judea is about 2,500 tons and that of Samaria and Galilee is about 4,500 tons. Most of the oil is used in the manufacture of soap. (op. cit.)

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Fig. 6

Fig. 7

Fig. 7
ARAB SESAME MILL

There are in Palestine about thirty-five Arab sesame mills and two Jewish mills with hydraulic presses. The Arab sesame mills can deal with from 150 to 200 kg. of sesame-seed per diem. The grain is husked after a preliminary softening in water, is then roasted and ground and the oil subsequently expressed from the pulp. Yield from 35 % to 40 %. (op. cit.)

Fig. 8
BEDOUINS MAKING BUTTER

Butter is made for the most part from sheep's milk by shaking it in goatskin bags. According to official data the butter produced annually in the mutessariflik of Jerusalem amounts to 80 tons, that in the vilayet of Beyrout to 220 tons, and that in the vilayet of Damascus to 825 tons. It is chiefly boiled butter or semne that is made by the Bedouins, the product being marketed by them in northern Syria principally in Aleppo. It is estimated that the southern Bedouins market from 600 tons to 2,000 tons per annum and the northern Bedouins about 500 tons. (op. cit.)

Fig. 8

Thus the total annual value of the oil industry of Palestine is about frs. 18,000,000, this comprising: olive oil frs. 3,500,000; sesame frs. 4,500,000; soap frs. 6,000,000; semne (including that of all Syria) frs. 4,000,000. In addition, Palestine and southern Syria consume imported varnishes valued at frs. 200,000, candles valued at frs. 300,000 and margarine valued at frs. 1,000,000.

The oil industry of Palestine would undergo extensive development were it organised on modern lines. Such interprises, if they are to pay, must be instituted on a considerable scale. A large amount of capital must be available for the purchase of olive oil during the season. The number of olive trees was insufficient before the war, and many of the trees have been destroyed while the war was in progress. At this juncture, therefore, olives have to be imported into Palestine as raw material for the oil industry. One of the first requisites is the cultivation of such plants as give an annual yield of oil (soy bean, arachis, cotton, etc.) and oil-bearing trees (olives and various euphorbiaceæ, alerites cordata, stillingia sebifera, castor oil, bay, the turpentine tree, etc.).

The oil industry must concern itself with: (a) the extraction of the remnants of oil from the offal of olives which have already passed through the ordinary presses (the annual amount of such available offal in Palestine is about ten thousand tons); (b) expression of oil from imported olives and from those which, as time passes, will be grown in Palestine in increasing quantities; (c) the solidification of oil for the manufacture of vegetable tallow and the manufacture of cooking butter; (d) the manufacture of soap; (e) the manufacture of varnishes (from hemp, linseed, and stillingia oil; (f) the manufacture of candles. As population increases, as demand extends, and concommitantly with a general rise in the standard of living and a wider development of other manufacturing industries, there will be excellent prospects for the oil industry. Beyond question, with careful management, this branch could be made profitable from the very outset.

3. ETHEREAL OILS. In Palestine these could be extracted from quite a number of plants. Jewish experimenters have made attempts to produce them from roses, geraniums, mimosas, and orange flowers, but these attempts have hitherto miscarried for various reasons. Oil of aniseed and oil of thyme are now prepared in Galilee. In the Jordan valley small quantities of oil are extracted from the Bohemian olive (balamites Aegyptiana). At Antioch, bay oil is extracted in considerable quantities, the

output being about two hundred tons per annum. The main difficulty in the way of developing these industries is the shortage of cheap labour, which is requisite for picking the flowers. In Beyrout, however, there is a large and successful French factory for the production of ethereal oils.

4. SUGAR REFINERIES. The annual consumption of sugar in southern Syria, exclusive of Aleppo, is about twenty thousand tons, this representing eight kilogrammes per head. The consumption in Europe is twelve kilogrammes per head per annum; in the United States of America it is thirty kilogrammes; in England it actually reaches the figure of thirty-six kilogrammes. Of the twenty thousand tons above mentioned, three thousand five hundred tons are imported by way of Jaffa.

There is a flourishing sugar industry in Egypt and during the seven year period from 1906-7 to 1912-13 the production gradually increased from forty thousand tons to sixty five thousand tons per annum. Ten thousand tons of sugar are exported from Egypt, but from thirty to forty thousand tons are imported. Palestine is well suited for the production of both beet sugar and cane sugar, and although the local consumption of sugar is small it is quite possible that this industry could be successfully established in Palestine.

5. COCOA & CHOCOLATE. The manufacture of these comestibles could be carried on in Palestine, in the first instance from imported cocoa beans, and mainly with an eye to the oriental market. Before the war the consumption of these commodities in Egypt was valued at frs. 800,000 per annum. With the extension of dairy farming, Palestine could follow the example of Switzerland and could develop the manufacture of milk chocolate. It seems probable that cocoa could be grown successfully in the lower part of the Jordan valley, and if so the country could supply its own raw material for the cocoa industry.

Sweetmeats, crystallised fruits, and halwa (prepared from the excellent Palestinian sesame), made in part according to European recipes, but chiefly, like those of Damascus, to suit local tastes, could be successfully produced for consumption in Palestine, and for the oriental market in general. Under able management there can be no doubt that this would prove a successful branch of industry.

6. BEER, WINES, & SPIRITS. Wine production is already well developed in Palestine. At Rishon-le-Zion, and Zichron-Jakob there are large and well-equipped cellars. At Mikwe-Israel, Rechoboth, Katrah, Petach-Tikva etc. there are smaller

cellars owned by Jews. At Sarona, Látrón Haifa etc. are cellars owned by non-Jews.

Spirit is distilled in Palestine from grapes alone. About one thousand tons of spirit valued at frs. 500,000 are imported into southern Syria, chiefly from Russia. Of late there has been a development of spirit-distilling in Egypt, the raw material being the molasses from the local sugar refineries. For the immediate starting of this industry in Palestine, the only raw material that suggests itself is durra, a variety of sorghum, a cheap cereal containing a very high percentage of starch. The annual production of durra in Syria is from one hundred and fifty thousand to two hundred thousand tons. For the preparation of better kinds of spirit, carobs (locust beans) could be used; Haifa and southern Syria export thirteen hundred tons of locust beans per annum. Various other vegetables containing large quantities of sugar, vegetables which thrive in Palestine and in Egypt and are cheap in these regions, could be utilised as raw materials for spirit manufacture. Among these may be mentioned the sweet potato (ipomœa batatas) containing 10 % of sugar, the Jerusalem artichoke, (helianthus tuberosus), containing 14 % to 15 % of sugar, and the kulkas (colocasia antiquorum). Yet other plants adapted for this purpose may be introduced in the future.

The beer annually imported into southern Syria is valued at frs. 300,000. Small as the demand is and expensive as is the establishment of a brewery in a warm climate, the high cost of freightage in the case of bottled beer suggests that local brewing would be profitable. Moreover, the local production of beer would doubtless be followed by an increase in the demand.

7. STARCH. This is now prepared from wheat at Damascus in twenty-two small factories. It is employed mainly as an article of diet. The yearly output is less than one thousand tons. The development of this branch of manufacture, like that the spirit industry, is closely associated with the prospects of agriculture and is dependent upon the cultivation of inexpensive starch-containing plants, such as durra, maize, and potatoes. The manufacture of dectrine, employed in dressing and stiffening textiles, and that of dectrose employed in jam-making in place of sugar, are closely connected with the same possibilities.

8. MATCH MAKING. For the manufacture of matches it will be necessary to import wood. The annual consumption in Palestine is about four thousand cases containing one hundred and twenty dozen small boxes each. The rest of Syria consumes

ten thousand cases. The consumption of matches in Egypt is valued at frs. 2,000,000 per annum. Several unsuccessful attempts have been made to establish small match factories; but in Jaffa, shortly before the war, the construction of such a factory was begun, and it is stated that the enterprise has been successful.

9. SAW-MILLS, associated with woodworking and veneering machinery, could be etablished as accessories to a wholesale timber business in one of the ports in order to supply the local demand for manufactured wooden articles. The principal source of import for such a business would be the southern coast of Asia Minor.

10. PAPER MILLING. The principal raw material now available for paper manufacture is straw. Drainage of the swamps will cut off such plants as papyrus, sedge, etc. as a source of raw material. By afforestation, however, a supply of woods suitable for paper manufacture, such woods as pine and poplar, could be assured. Rags for the milling of the better qualities of paper could be collected locally or imported from neighbouring countries. From Egypt two thousand tons of rags are exported annually to England. Already before the war the local demand for paper was considerable, the annual imports being as follows:

	Beyrout	Palestine & Syrian Ports others than Beyrout	Egypt
	tons	tons	frs.
Brown-paper	460	340	4,000,000
Cardboard	420	120	
Printing paper	300	95	3,000,000
Writing paper	250	60	
Cigarette paper . . .	65	45	1,000,000
Other varieties . . .	220	270	3,000,000
Total values	frs. 600,000	frs. 1,000,000	11,000,000

For the packing of oranges Palestine uses about two hundred and seventy tons of tissue paper. Unquestionably the demand for paper, and above all for printing paper, will undergo an enormous increase in Palestine, pari passu with the general development of the country.

11. TEXTILES. The production of sheep's wool in southern Syria before the war was about twelve hundred and fifty tons per annum, and the Bedouins from Arabia (distinct from the northern Bedouins) brought a similar quantity to sell.

Wool was exported to the value of frs. 3,500,000 chiefly by way of Beyrout and Tripoli (Tarabulus). For the textile industry of southern Syria, ten thousand bales of yarn, for the most part

cotton yarn of inferior quality, are imported from Italy, India and England. The value of this import is about frs. 20,000,000. In addition, Alexandretta imports yarn valued at from twelve to twenty-five million francs. The figures above given include about one hundred tons of woollen yarn.

As far as Palestine is concerned, the cultivation of cotton is still in the experimental stage, but cotton is grown in northern Syria, the output being about two thousand tons per annum. If Palestine is to share in the prosperity of the textile industries of Syria, if spinning mills for wool or cotton are to be established in Palestine, it is essential that there should be in the south a simultaneous development of weaving mills. (For further details see Chapter V.) The wool-washing industry must be associated with wool-spinning, and wool-fat is an important by-product. In connection with the development of this industry it will be essential to establish great purchasing centres east of the Jordan on the Bedouin route froom north to south.

12. TANNERIES. The tanning industry is fairly well developed in northern Syria, but has made little progress in Palestine. In Syrian towns, chiefly Damascus, Aisotab and Aleppo, about half a million lamb-skins and goat-skins, are tanned every year, and manufactured into red and into yellow satienna. Dressed hides are made into box-calf and into veaux satinés.

The local production of leather is far from satisfying the demand. It is true that there is an export valued at more than frs. 1,000,000, but against this there is an import of undressed and dressed skins valued at about frs. 6,000,000.

Since leather dressing is an industry widely engaged in by Russian Jews, tanning and the leather industry might well be developed in Palestine, seeing that entrepreneurs and experts in the business could easely be secured. Preferably, however, the industry would depend upon imported undressed skins, for the skins obtainable in Palestine are few in number and poor in quality. But materials requisite for tanning, such as gall-nuts and sumach are obtainable in abundance.

Beyond question a tannery, if it could find a local market in the form of a well-developed boot and shoe industry and of an industry for producing other manufactured leather goods, would have excellent prospects of success (see below in Chapter V).

13. MACHINE CONSTRUCTING AND REPAIRING WORKS. Before the war, establishments of this character in Palestine employed from four to five hundred workmen. About

five hundred tons of castings are made annually in Palestine, chiefly for pumps, milling rollers, and oil presses. Should local manufacturing industry develop and should Palestinian agriculture be modernised, the local market for machinery would be greatly extended, and works of this nature would flourish. Were the government to undertake railway development, engineering works might be founded for the supply of materials needed in construction. If sufficient capital were available, under experienced management such enterprises might prosper.

14. BUILDING MATERIALS. In southern Syria from eight to ten thousand tons of cement and nearly seven thousand tons of hydraulic lime have been utilised annually, the Palestinian consumption of hydraulic lime being six thousand tons. In view of the reconstruction works now imminent, a manufactory capable of turning out twenty thousand tons of cement and ten thousand tons of hydraulic lime might well be established without delay. The neighbourhood of Haifa would be the most suitable site.

Gypsum is chiefly imported into Beyrout, about one thousand tons being utilised here every year. It is also used in Damascus for local purposes in an extremely primitive manner. The gypsum deposits near Melhamieh and the still richer deposits at Jebel-Usdum could be usefully exploited for the home market were there but greater facilities for transport from the Dead Sea region. Roofing tiles and glazed tiles to the number of from four to five million are imported into southern Syria, half of them going to Palestine. A considerable proportion of these tiles could be produced at the tile and brick works of the Syrian orphan asylum in Jerusalem. Jerusalem, however, is not the best centre for this industry, owing to the high cost of transport thence to other parts of the country. Good clay for brick and tile making is procurable in various localities.

GLASSWORKS. If the mistakes made in establishing the great glassworks at Damascus are to be avoided, careful preliminary enquiries are requisite as to whether glass manufacture can be made to pay in Palestine. The local demand is at present insignificant, amounting only to an estimated value of about frs. 1,000,000 per annum. Seeing that fuel is so dear and that a very great variety of glassware would have to be manufactured, the prospects for this industry are not encouraging at present.

SILICATE STONE. The manufacture of silicate stone slabs might be undertaken in Jaffa and in other places where good

sand is obtainable. But when the methods of quarrying have been brought up to date and when transport facilities have been improved, the competition of natural stone will be serious.

15. THE CHEMICAL INDUSTRY cannot within any period easy to foresee reckon upon a local demand which would justify attempts to exploit all the treasures of the Dead Sea region, as for instance by the production from sodium chloride of caustic soda, sodium carbonate, sodium sulphate, hydro-chloric acid etc. In Chapter II we have referred to the possibility of utilising the potassium salts in carnallite and of extracting bromine. Here the chances of successful development are certainly better. It is quite possible also, that small works producing sulphuric acid and carbon disulphide for the local market would pay very well. A further lucrative possibility is to be found in connection with the utilisation of water power from the Jordan or is tributaries in extensive works for the production of nitrogen from the air. Used in the manufacture of artificial manures, nitrates thus obtained would contribute notably to the development of agriculture.

The foregoing sketch will have shown that the possibilities for the growth of large-scale manufacture are closely interconnected with those for the development of agriculture, with the practicability of exploiting the mineral treasures of the country, and with the chances of an increase in population, a rising standard of life, and a general enhancement of demand.

Strict legislation for the safeguarding of private property, the abolition of the speculative monopolies and concessions which hinder the proper utilisation of mineral wealth, improved and cheapened transport facilities, and above all a unified administration which with intelligent forethought shall envisage the many sided development of the country — such are the prerequisites to the success of new manufactures.

Large-scale industry in Palestine must be based upon private enterprise, the enterprise of persons possessing the capital, and the expert knowledge that are indispensable. These persons must be enabled to secure experienced managers, foremen, and technicians and they must be willing in most cases to renounce the prospect of making high profits forthwith. Under such auspices, and with due precautions, a revival of Palestine might be effected, for the country, though at present to a large extent a desert, is favourably situated, and has wealthy neighbours. Thus general wellbeing might be ensured; regular employment might be provided for many thousands; and for many thousands more, possibilities for an active existence might indirectly be furnished.

CHAPTER IV.

THE LABOUR QUESTION

The labour question is of vital importance to the development of manufacturing industry and above all to the development of those branches of industry which employ a large number of work-people as compared with the amount of capital invested in plant, for the development, that is, of small-scale industry and handicrafts. Throughout Palestine the opinion is widespread that the unskilled Jewish workman, demanding high wages and displaying a low productivity, is less adapted to fulfil the local labour requirements than are the native workers, and is unable to produce wares capable of challenging competition. The contention is not wholly unfounded, but is only applicable to the conditions now obtaining, wherein the working methods are adapted to the requirements of the native-born population, where they are consequently primitive in character, and where the mentality and the bodily powers of the Jewish workers (physically weak though mentally well developed) are not given a fair chance. The opinion, moreover, correct as it may be in particular instances, cannot be accepted as a generalisation.

Experience teaches that the productive powers of a cultivated workmen, one aware of his own capacity, are so great that throughout the world it is cheaper to employ him and the results are more satisfactory than when a coolie whose demands are smaller is engaged. But the skilled workman must be furnished with modern applicances to enable him to do his work successfully. His culture fits him for the utilisation of up-to-date methods and his self-respect brings in its train a sense of responsibility. For these reasons, a skilled and intelligent workman when employed under suitable conditions is certainly more productive than a man of less skill and intelligence and is better capable of work which will challenge competition, despite his higher wages and higher standard of life, which are essential to his existence. These theoretical considerations are confirmed by American experience, for in America the workmen's wages are from three to five times as great as in Russia or in Palestine,

Fig. 9

Fig. 9

THE DRYING OF CHEESES BY THE BEDOUINS

The cheese is produced from full milk with the aid of an animal ferment. According to official statistics, the annual production of the mutessariflik of Jerusalem is 150 tons, that of the vilayet of Damascus 1,000 tons, and that of the vilayet of Beyrout 1,000 tons. (op. cit.)

Fig. 10

WINE CELLAR AT ZICHRON-JAKOB

The largest cellars are those owned by the Jewish Vintners' Association at Rishon-le-Zion, Rechobot Katrah, Petach-Tikva and Zichron-Jahob; these establishments deal annually with 6000 tons of grapes and produce 40,000 hectolitres of wine. There are also cellars at Mikweh-Israel and several private establishments (production 3000 to 5000 hectolitres); the German Vintners' Association in Jaffa and Haifa (production from 6000 to 8000 hectolitres) Látrón (production 1000 hectolitres) and Lebanon (production 5000 hectolitres. (op. cit.)

Fig. 10

Fig. 11

Fig. 11
FISHING IN THE SEA OF TIBERIAS (I)
with the casting net known as „shabake"

The principal varieties of fish in the Sea of Tiberias and the waters of Merom are: — Chromis Tiberiadis; 2 Barbuscanis; 3 Clarias Macracantis a fish which has lungs as well as gills and can live out of water in damp place for three or four days. (op. cit.)

Fig. 12
FISHING IN THE SEA OF TIBERIAS (II)
with the net known as „mbaten" 200 m. in length

The Sea of Tiberias has an area of 14,400 hect. and its greatest depth is 57 m. The area of the waters of Merom is 1390 hect. The annual catch from the two lakes taken together is estimated from 150 to 200 tons. (op. cit.)

Fig. 12

and in the States he not anly produces complex manufactured articles but also agricultural products, more cheaply than they can be produced in Palestine. It must not be supposed that in America work is invariably performed with the aid of complicated machinery. In many instances some simple but cleverly designed appliance enables the work to be done, well and cheaply. Take, for example an elementary engineering operation. Before the war, in Palestine, when sand or soil had to be dug up and removed to some short distance, from forty centimes to one franc per cubic metre had to be paid, the charge varying with the nature of the soil. The labourers, persons of both sexes, carried the material in tubs, and their daily earnings ranged from fifty-five centimes to one franc fifty centimes. For similar work the Americans use a troughshaped shovel, the so-called „scarper" drawn by two horses. Should the ground be too hard for the use of this implement it is first broken up with the plough. As soon as the shovel of the scarper is full, pressure on the handle raises the shovel from the ground. It is then slid to the desired place, or conveyed thither upon wheels, and emptied by tipping. Work carried out in this manner near Fort Collins, where a dam three metres in height was being built in connection with an irrigation scheme, cost fifty centimes per cubic metre. In the Modesto Irrigation District of California, an aqueduct two metres in depth was excavated at a cost of thirty centimes per cubic metre. The team of a scarper, including the driver's wages of two dollars, costs three dollars twenty-five cents (frs. 17) a day. Fodder is inexpensive and represents one dollar of this amount. In Palestine, though human labour is cheap, the upkeep of two horses costs from frs. 6 to frs. 8 per day.

Yet more striking instances might be given, showing the comparative avantages of modern applicances as against primitive methods. For instance, in a cooperative factory near Ogden where tomatoes are canned, with the aid of a perfectly designed soldering apparatus one solderer with two assistants is able in a single day to seal fourteen thousand tins each containing two and a half pounds of tomatoes. At San Jose in California, with the use of the same applicance, fifteen thousand tins were sealed in one day.

In the textile industry a weaver working at a power-driven loom will turn out as much as one hundred and twenty metres of cotton cloth in a day of from eight to nine hours, whereas the best Syrian weaver, working at a hand-loom, for a day of

from twelve to fourteen hours, cannot produce more than ten or twelve metres of plain woven cotton cloth.

It would be superfluous to give additional examples. Those already adduced will suffice to show that the Jewish workman, a man of comperatively high intelligence, if set to work under conditions suited to his mental and physical capacities, would be able, though paid higher wages, to produce commodities that could successfully challenge competition with those made by lower grade labour.

The chief supply of labour for the prospective industries of Palestine must be drawn from Jewish immigrants arriving from Poland, West Russia and Galicia. Statistics of the year 1910 classified the Jews according to occupation as follows:

Occupation	Russia		Austria		Germany	
	Persons	%	Persons	%	Persons	%
Agriculture . .	37,373	2.4	57,004	12.3	3,371	1.4
Industry	555,229	36.3	122,728	26.5	45,993	18.8
Commerce and transport . . .	520,938	34	153,401	33.3	133,451	54.5
Domestic Service and Casual labour	125,750	11.5	39,457	8.5	7,260	3
Public Services and liberal professions . . .	175,109	8.2	36,971	8	14,641	6
Unproductive and unclassified occupations . .	116,338	7.6	52,792	11 4	39,870	16.3
Totals	1,530,737	100	462,353	100	244,586	100

It thus appears that more than one third of the Jews in Russia and more than one fourth of the Jews in Austria (in Galicia for the most part) are engaged in industrial pursuits. Additional and more detailed statistics are available showing that about 50 % of Russian Jews are actively engaged in productive occupations, devoting themselves to all possible branches of manufacturing industry and handicraft. Beyond question from these sources it would be possible to derive a supply of labour extremely well adapted for the industrial colonisation of Palestine. This is a suitable place for a description of the intellectual qualities of the Jews considered in relation to their capacities as industrial workers. The account is based upon knowledge obtained by

the writer through practical experience during many years' association with Jewish workman in Russia and in Palestine.

The Jewish workman of Russian origin is in most cases a strong individualist. He is inspired with definitive ambitions, desires to better himself, and thinks more of the future than of the conditions under which he is living at the moment. His main aim is to secure independence. He will not work with care and diligence unless he personally understands the object of what he is doing, realises its necessity and recognises that his own interest is involved. When employed at a fixed wage he will endeavour to take things easily and to work as little as possible, showing scant concern for the quality of his work if he is driven to it simply by the spur of need and if he fails to see that he can gain anything for himself by more strenuous activity. In such circumstances his mind turns rather towards goals and ideas which will bring him spiritual satisfaction; for the struggle towards a distant aim, the struggle for an ideal, is in his very blood. He insists upon a good wage, finding it impossible to live upon a pittance. In general intelligence, and in his capacity for grasping new ideas he is little if at all inferior to the western European workman. Indeed he excels in alertness, and receptivity, but fails somewhat in respect of punctuality and staying power. The Jew is always trying to make his work easier and to get as much out of it as possible. Highly skilled workmen are rare among the Jews. Jewish builders in Palestine have learned their craft from the Arabs and are inferior to these alike in theoretical knowledge and in practical skill. Conditions are little better in Russia, where Jews have been unable to obtain employment in the larger and better equipped factories and workshops, so that their training has mostly been obtained in small Jewish workshops, where modern methods of work are unknown, where the work is often botched, where unsuitable tools are used, and where cheap and inferior articles are turned out. Directly the Jewish workman sees a chance of becoming independent he opens a workshop of his own and continues there the same unsatisfactory methods of production.

My opinion on this matter is fully borne out by the statistical data on industries and trades in the pale of settlement. These data, compiled by the Jewish Colonisation Association in the year 1898, relate to twenty-five administrative districts in Poland and western Russia. They show an immoderately high percentage of masters, a small proportion of journeymen, and a very

high proportion of apprentices as compared with the journeymen:

	Masters	%	Journeymen	Apprentices	Totals
1. Foodstuffs	43,655	75	9,675	4,547	57,887
2. Clothing and laundry	84,915	44	62,667	46,372	193,954
3. Leather	40,522	47	25,562	19,222	85,306
4. Woodwork	25,653	52	14,119	9.816	45,588
5. Metalwork (unskilled)	13,296	47	8,680	6,417	28,393
6. Metalwork (skilled)	12,203	60	4,212	4,113	20,528
7. Chemicals	2,764	76	594	259	3,617
8. Building and pottery	19.791	63	7,994	4,705	31,590
9. Textiles	10,589	57	4,582	3,257	18,428
10. Printing and bookbinding	5,998	51	3,343	2,354	11,965
Totals	259,396		140,528	101,062	500,986
Percentages	52%		28%	20%	100%

We see that, on the average of the total persons engaged in these industries 52 % are masters whilst only 28 % are journeymen and 20 % are apprentices. Thus to every hundred masters there are no mare than fifty-four journeymen, whereas there are nearly forty apprentices. Of like character is the situation in Roumania. In that country of 19,289 Jews engaged in manufacturing industry 9801 (51 %) are masters, 5551 (29 %) are journeymen and 3937 (20 %) are apprentices. During the last two decades a notable improvement has occurred in these respects. On the other hand, during the years of the war the training of workmen and skilled foremen and managers was greatly hindered. In the pale of settlement for nearly five years manufacturing industry was at a standstill, this applying above all to the Jews. The young men were called up for military service and were thus deprived of any opportunity for learning their trade. The result was in the case of nearly all the younger journeymen that technical knowledge was forgotten and the hand lost its cunning.

Sound technical training of the workmen and the introduction of modern working methods are of prime importance to the development of the newer Jewish industries in Palestine. In default of such conditions the new manufacturing industries will not undergo proper expansion and the Jewish workers will be unable to compete with those engaged in native industries carried on by the old methods. All the more is it indispensable that the new industries should be modernised, since Palestine, as far as can be foreseen, will have no protective tariffs, and will

have to face the unrestricted competition of the civilised European states.

In Russia, technical schools are established among the Russian Jews to promote the development of industry and to increase the skill of the workers. Unfortunately the desired ends are rarely obtained by these methods. Experience shows that it is extremely difficult to learn a trade properly in a technical school and in default of several years' practical experience. Especially is this so in the case of a Jewish pupil, who does not usually spring from a family of skilled workers and who has had no previous technical training. Quite a number of students in the Jewish technical schools, when the close of their term of study was approaching, were inspired with the ambition of becoming technicians and engineers. Often enough, however, such young fellows had to content themselves with situations as clerks, making the most for this purpose of their theoretical acquirements and reaping no benefit from their years of manual training, which had after all been imperfect and did not enable them to command an adequate wage. A few only of the pupils practised a skilled trade on leaving the technical school, endeavouring to continue and perfect their training in workshops and factories. Experience has shown convincingly that a highly skilled workman can be trained only through practical work in factories and workshops producing a high class of goods. For completing the technical knowledge of a workman what is requisite is attendance at evening schools where the training is of a practical nature, not at such schools as confine themselves to cramming his head with theoretical generalities of very dubious value.

During the foundation of the new Palestinian industries to be carried on by Jewish workmen these considerations must be given full weight. Large-scale industries must be installed, industries turning out commodities with modern machinery, as fully automatic as possible, and in which the workers' task is confined to supervising and directing the machine. The workmen employed in such industries, comparatively few in number, must be given a personal interest in the success of the enterprise, as by profit-sharing, by facilities for securing by easy payments residences in garden cities, and by other provisions for the welfare of the employees.

In small-scale industries on the other hand, those wherein commodities are manufactured in large quantities and in which each individual workman produces the finished article,

where the entire process of production is under his eyes, and where the capital expenditure upon machinery is small, the workmen or groups of workmen must be allowed to assume independent but orderly control of the operations. Here the individualist spirit and the sense of independence characteristic of Jewish workers will have free play; their diligence and intelligence will operate to the best advantage, contributing alike to the prosperity of the individual worker, to the success of our manufacturing industry, and to the fulfilment of our national aspirations.

To this end, and for the furtherance of small-scale industry, crafts, and trades, model factories must be established. Should it appear, after due consideration, that any particular branch of industry is likely to be useful and profitable in Palestine, trusty and highly skilled workmen, men with years of experience, must in the first instance be secured. It might be desirable and even essential, when a new branch of industry has to be thoroughly learned, to despatch skilled workmen abroad to complete their training in regions where this particular branch of production has been brought to perfection. The next stage would be to found model workshops, small places but whith a thoroughly modern equipment, either subsidised private enterprises or purely national concerns. In these the selected industry would be carried on for a time under tutelage, while the foremen and the skilled workmen were being thoroughly trained, while the new commodities were making their way in Palestine and in adjoining countries, while buyers were becoming acquainted with the products, and while a market was gradually being secured. When the new manufacture has passed the experimental stage and has proved profitable, when a group of workmen, on piece-work, are able to make the desired profit, the undertaking should be assigned to independent groups of workers or to cooperative societies. Thoroughly up-to-date machinery, driven where necessary by mechanical (electrical or other) power should be placed at the disposal of the workers on easy terms of purchase. In addition a central station must be established for the purchase of raw materials and for the sale of the finished products. In most cases there must be a central workshop where the requisite finish can be given to the articles made by individual workmen at their homes or by groups of workmen in cooperative workshops. As a rule the model factory can serve this purpose. An industrial bank should be established to finance these small-scale

industries, and there should be a national technical bureau to keep them under due observation.

We stand to-day on the threshold of a social transformation; a revaluation of the old values is at hand; stereotyped ideas and social ordinances are about to be swept away. Now, when we hope to build up a new Palestine, is the time when we should make an effort to avoid the old errors. As far as the working and productive elements of society are concerned, we may find it possible, to a large extent, to fulfil the traditional desire for an association of industry with agriculture. In this wise, perchance, we may be able to make the workman independent, to promote the intensity of his working powers, to raise him in the physical and moral scale, to counteract the deleterious influences of factory labour, and to obviate the occurence of strikes which are ever injurious to the progress of an industry. The endeavour should be made to house the workers in garden cities. Facilities should be given for the cultivation of fruit, vegetables, and flowers, an allotment being provided with the possibility of purchase on easy terms. The allotment should be close to the dwelling house, and this latter should also, when desirable, have a workshop with electrical installations. Every workman should work at his skilled trade vigorously but for short hours only, either in his own house or in the cooperative workshops, and should then secure a change of occupation by cultivating his garden under the free air of heaven. The nature of each particular branch of industry will determine whether cooperative workshops are requisite or whether each workman should have the necessary appliances in his own home and thus be independent within the group. Aided by his family, each workman might produce in his own garden a considerable proportion of the food stuffs required for domestic use, and such agricultural labours could not fail to be health-giving to the wife and children as well as to the man. Thus the worker: 1. producing his own food, could live at once more healthily and more cheaply; 2. furnished with up-to-date applicances he could produce goods able to challenge competition; 3. he could lead an independent life, could utilise his working powers to the full, could develop his individuality, and make the most of his avantages. By cooperative stores and by centralised arrangements for the purchase of raw materials and the sale of manufactured goods, the producers could to a considerable extent obviate the high costs of factory administration and could avoid having to pay profits to middlemen. With good cooperative

organisation the workers would unquestionably do very well, would be able to pay off the preliminary loans and would become perfectly independent.

The system here sketched, in which the process of manufacture is decentralised internally and centralised in relation to the outer world, a combination of industry with agriculture, and the securing of an independent position for the individual worker, would seem to be the most appropriate methods for the development of small-scale industry and handicraft in Palestine, by Jewish workers. Working under such conditions, the labourer would be able to develop his individuality and his intelligence, and would have his personal life established on a solid foundation. Slowly but surely the industry and commerce of Palestine would attain a higher level of development.

Fig. 13

SYRIAN WEAVER

Hand-loom weaving is a flourishing industry in Syria. The yarn woven in these looms is for the most part imported. Before the war there were 30,000 looms at work in Syria. One third of these were weaving cotton and a little wool, and one third of them silk and half-silk. In Palestine there were only 800 looms, most of these being at Mejdel near Gaza. The average amount of plain cotton cloth turned out by these hand-loom weavers is from 10 to 12 m. per day, the width of the material being 51 cm. (op. cit.)

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Fig. 14

POTTER IN NAZARETH

Potteries are found in Nazareth, Náblus, Ramleh, Hebron and Gaza. This handicraft used to flourish especially at Gaza where pots of black earthenware of fine quality were produced, mainly for export to Egypt and elsewhere. (op. cit.)

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Fig. 14

Food Stuffs	Egyptian imports from Turkey during the year 1911			Production in Syria (Damascus, Beyrout, and Jerusalem; Aleppo excepted) tons
	Kilogrammes	Estimated values in frcs.	%	
Meat, salted, smoked, tinned	239,608	280,000	10	125 (exported from Alexandretta)
Fish, salted, smoked, tinned	112,048	167,000	13	150—200 (fish caught in the Sea of Tiberias and the Waters of Merom)
Butter, boiled (semne) or fresh	676,951	1,470,000	65	1000—2000 (semne produced locally and also that brought by the Bedouins)
Cheese	2,619,267	3,140,000	57	2000
Honey	67,534	54,000	77	12
Various flesh foods	—	137,000	54	—
Starch	8,936	3,700	1	1000 (produced in Damascus)
Cereal foods	15,249	13,700	0.3	—
Raisins	5,817,444	875,000	90	4000—7000
Olives	1,407,320	590,000	50	12,000
Dried fruits	9,709,112	4,200,000	67	500—1500 (dried apricots) 3000—5000 (apricot dough)
Bottled fruits and vegetables	—	75,500	7	600 (dried figs)
Other vegetable products	—	216,000	19	270 (preserved fruits and vegetable)
Jam and candied fruits	389,573	316,000	12	6000—8000 (fruit honey)
Olive oil	1,390,277	1,430,000	70	7000 (two years' production)
Other vegetable oils	159,055	138,000	1	500—700 (sesame oil)
Soap	5,758,148	4,900,000	81	9000
Wine in cask	3,922,622	1,020,000	34	(hectolitres) 50,000
Tobacco	3,262,450	14,000,000	46	1000—1500

The goods imported from the Turkish empire have been mostly cheap and nasty, and it should be the aim of Jewish industry in Palestine to produce wares of a better quality even if they should be more costly. Producers should not think solely of the Egyptian market; but since the annual value of the imports into Egypt is from £25,000,000 to £30,000,000, Palestine ought to be able to get a share of the trade.

2. PRESERVING. The possible extent of this industry depends upon the available supply of fruit and vegetables. Apart from olives, grapes, almonds, and oranges, Palestine does not

at present grow large quantities of any fruit suitable for this industry. (Damascus produces annually nearly one hundred thousand tons of apricots; and large quantities of apples and quinces are grown in Damascus and Zebdani.) At first, therefore, this industry will have to concern itself mainly with the preserving of vegetables. With an up-to-date plant it should prove possible to supply preserved fruits and vegetables after the European manner. With modern methods of work the industry can be carried on quite economically. For example, the cooperative canning business at Ogden in the state of Utah to which reference has previously been made, though paying high wages, was able to turn out daily fourteen thousand tins of tomatoes containing two and a half pounds each at a price of from seventy-five centimes to one franc per tin. The agricultural workers in this industry received a monthly wage of from thirty-five to forty dollars with board in addition, while many of the factory hands were paid as much as four dollars per day; but, as already said, with the use of modern machinery the factory hands can work in a most economical manner. If Jewish labour in Palestine is to enter into competition upon the world market, the adoption of similar methods and appliances is indispensable.

3. MACARONI AND OTHER CEREAL FOODS are produced locally in small quantities only. The yellow and shiny Hauran wheat is said to be well adapted for the manufacture of macaroni; if this be so, this branch of industry might be well developed. In Italy some twenty-five thousand to thirty thousand men are engaged in the manufacture of macaroni. It seems quite likely that this industry, together with the manufacture of other cereal foods, including biscuits, might thrive in Palestine and might provide employment for large numbers of persons.

4. THE FISHING INDUSTRY in Palestine is carried on by extremely primitive methods. Despite the extensive cost line of the country, the local sea fisheries are not able to meet the demands of the sea-ports, so that of late Jaffa has annually imported more than four hundred tons of fish (salted, smoked and tinned.) The industry should be developed in the form of a deep sea fishery, and employment could thus be provided for a great many persons. It may be noted that in Russia about eight thousand five hundred men make a livelihood as fishermen. According to Italian statistics of the year 1914 there were one hundred and fifty thousand fishermen in that country and twenty-nine thousand four hundred and eighty-six fishing smacks.

The fish-canning industry is closely connected with the ordinary fish industry. Fish canneries could be established on the sea coast and on the shores of the Sea of Tiberias. The annual catch in the Sea of Tiberias and the Waters of Merom is estimated at from one hundred and fifty to two hundred tons. It is stated that a variety of sardine (engraulis encrasicholus) appears every spring in vast numbers in the waters southward from Jaffa. Flounders are likewise met with in these waters.

5. THE TABACCO INDUSTRY of Palestine is hampered at present by the monopolies of the Regie Company. Among the Jews of Russia there are many skilled persons engaged in tobacco culture and in the later stages of tobacco manufacture. According to statistics for the year 1910 of the Jewish population of Russia, 17,547 persons were engaged in the tobacco industry. The prospects of the industry in Palestine are unquestionably favourable, and if properly developed it could provide employment for thousands of persons. Moreover, the tobacco industry, especially in the form of cigarette manufacture, is one well suited for home industry. Palestinian tobacco would find a good market in Egypt, which imports annually about ten thousand tons of tobacco and cigarettes in addition. Forty per cent of the tobacco comes from Turkey. The export of cigarettes from Egypt amounts to about five thousand tons, at an estimated value of frs. 10,000,000.

6. THE TEXTILE INDUSTRY is well developed in southern Syria notwithstanding the primitive methods employed. There are more than fifteen thousand hand-looms in this region and there are besides in the vilayet of Aleppo and additional fifteen thousand hand-looms. Of the southern Syrian looms, two thousand five hundred are engaged in weaving silk and three thousand in weaving half-silk goods. The looms work for the most part upon imported yarn. The imports of cotton are three thousand tons, of flax two thousand tons, of wool one hundred tons, and of silk two hundred tons, the total value of these imports being estimated at frs. 10,000,000. Native hand-spun yarn and silk are also woven. The cloth is specially produced for the eastern market, being partly sold in Syria and partly exported. As far as Palestine is concerned the industry is little developed, for there are only eight hundred looms, for the most part in Gaza an Mejdel.

The output of southern Syria has an estimated value of from frs. 20,000,000 to frs. 30,000,000. The marine export of

textiles (the export of Aleppo excluded) comprising silk, cotton, and woollen piece-goods, had an estimated value of frs. 3,000,000. The import of textiles (Aleppo again excluded), British for the most part, had an estimated value of from frs. 40,000,000 to frs. 50,000,000. The estimated annual consumption of textiles per head of population is from frs. 20 to frs. 25. Egypt imports annually textiles to the value of frs. 200,000,000, the imports from Syria and the rest of Turkey being valued at frs. 5,000,000.

During the last quarter of the nineteenth century, owing to European competition, the value of the Syrian textile industry had declined by about one third. As far as it has been able to maintain its position, this has been owing to the peculiar character of the oriental demand (which the European looms have not been able to satisfy perfectly), owing to the very low wages earned (from fifty centimes to two francs per day of from twelve to fourteen hours), and owing to the use of cheap varieties of yarn, some of it being refuse yarn which cannot be woven in power-driven looms. The Palestinian textile industry, advantageously related to the domestic and neighbouring foreign markets, would certainly flourish if, while producing goods specially suited for the eastern market, it were to employ power-driven looms wherewith each workman in the normal working day of eight hours can turn out ten to twelve times as much cloth as a handloom weaver. Plenty of skilled machine-loom weavers are to be found among the Jews of western Russia and Poland (in the year 1910 among the Jews of Russia 93,144 persons were engaged in the textile industry), but these Russian Jews would have to adapt their work to eastern requirements. With good organisation it would not take long to introduce power-driven weaving into Palestine. Ably conducted, the industry would flourish abundantly and would provide a large amount of employment.

Spinning, cloth-dressing, and dyeing are closely connected with weaving. Apart from these, there are many branches of the textile industry such as hosiery-making, carpet weaving, felt-making, rope making etc., which could be developed locally. Before the war, there were at work in Damascus and Aleppo from six to eight thousand sock-knitting machines. At the same period there were annually imported from Germany and still more recently also from Japan, socks and stockings to the value of from frs. 1,500,000 to frs. 2,000,000. Simple felts, used mostly to make saddles for donkeys and camels, are produced by primitive methods; felts of better quality are imported. The

rope-walks of Damascus, using local hemp as the raw material, turn out annually from one thousand to fifteen hundred tons of rope and cordage, supplying the eastern market in general. The rope is twisted by hand in primitive fashion, and though the hemp is good the finished rope is greatly inferior in quality to that of European manufacture. The introduction of the American aloe, from which sisal hemp is prepared, would give a great impetus to the Palestinian rope and cable manufacture, so that the industry might assume large proportions. The region of southern Idumæa would probably be well suited for the cultivation of this aloe (agave Americana) for the plant thrives in an exceedingly dry climate. With a rainfall ranging from thirty five to forty centimetres, a hectare of land planted with the American aloe will yield annually from thirty thousand to forty-five thousand leaves, or from seven hundred and fifty to twelve hundred kilogrammes of sisal hemp. Ships' cables of the finest quality are manufactured from sisal hemp; the stronger fibres are used in brush manufacture; the finer sisal hemp and the fibres of banana leaves are utilised in weaving and in the making of hosiery. The Palestinian Jews have an opportunity for modernising the entire textile industry and for manufacturing thoroughly good articles, in part out of materials already grown locally and in part out of materials produced from plants to be acclimatised in the future. By working for the market which is already open, by providing the east with goods of superior quality, and by employing up-to-date methods and the most modern machinery procurable, it would be possible to provide for the paying of higher wages, such as are necessary for the higher standard of life of the Jewish workers.

7. THE CLOTHING INDUSTRY. In this industry, and above all in the ready-made clothing trade, the Jews lead the world, providing goods of this class, not merely for local use, but likewise for export. Ready-made clothing and boots and shoes were imported before the war both into Palestine and into Syria. Even more extensive were the imports into Egypt (ready-made clothing and underclothing valued at frs. 25,000,000; boots, shoes etc. valued at frs. 7,000,000).

There is no doubt that this branch of industry and commerce could be developed locally, not only for the Palestinian and Syrian market but for export to neighbouring countries, thus furnishing employment for many thousands of workers. In Germany, in the year 1895, per million of population thirty thousand persons were engaged in the clothing industry (in the widest

sense of that term); in Egypt, where the standard of life among the countryfolk is so much lower, the proportion thus engaged is seven thousand per million of population. Throughout the world, the industry is carried on chiefly in small workshops. In Palestine, with cooperative methods and with centralisation for purchase and sale, excellent articles well-adapted for local demands could be produced, and could gradually make their way into the general oriental market.

8. STRAW-HAT MAKING. This could likewise be introduced into Palestine with good prospects of success. We are given do understand that the papyrus plant which grows wild on the Hule plain would be very suitable for making straw hats, and that for this purpose it could be grown in Palestine. Straw-hat making is a flourishing industry in Italy, occupying more than one hunderd and twenty thousand persons, two thirds of these being Tuscans. Besides providing for the local demand, Italy exports annually straw-hats valued at frs. 30,000,000. Under expert management this manufacture might thrive in Palestine and provide plentiful employment.

9. BUTTON MAKING from mother-of-pearl was begun in Jerusalem during the year 1914 by the Strauss factory and proved profitable. Palestine may be encouraged by the example of Japan where the manufacture of mother-of-pearl buttons was initiated towards the close of the nineteenth century. So rapid was the progress of the industry that within a brief period goods to the value of frs. 50,000,000 were being produced annually. Excellent mother-of-pearl can be secured upon the western shores of the Red Sea, and mother-of-pearl of somewat inferior quality can be obtained from the Persian Gulf. The making of buttons from mother-of-pearl as well as from various metals, from horn, bone cocoanut shell, and other materials might well become a home industry in Palestine. Here again, under expert management and with the necessary mercantile ability, the industry would thrive and would provide work for thousands.

10. ARTISTIC CRAFTS have been carried on for centuries in Jerusalem and Damascus. Although Jerusalem, owing to its sacred character and owing to the great afflux of tourists to the city, would seem to be extraordinarily well-adapted for all kinds of artist craftmanship, the growth of these industries has remained within moderate bounds. In Jerusalem and Bethlehem the chief manufactures of this kind have been religious ornaments made from mother-of-pearl and olive wood, giving occupation to one thousand persons; in Damascus about two thousand

persons are engaged in artistic crafts, the principal being the making of brass ware. The wages are low, above all in Damascus; the models are simple and monotonous; generally speaking the execution is rough and primitive. It is natural, therefore, that the market should be restricted. By modernising the industry, by the manufacture of articles suitable for the world market though retaining the Jewish oriental style, by the introduction of machinery and modern appliances whilst reserving handicraftsmanship for artistic articles of higher quality — in a word, with expert management and sound business principles, there can be no doubt that the artistic crafts would flourish abundantly in Jerusalem. (For example we learn that before the war, in and around Pforzheim nearly eighty thousand persons were engaged in the jewelry industry.) The pioneer entreprises of „Bezalel" have given the initial impetus to this industry in Jerusalem. Bezalel's experience which lasted several years may serve to point the proper path of development and may render possible the avoidance of numerous errors. The indispensable requisites are these: suitable models; permanent exhibitions in Jerusalem and in the great capitals of the world; the cooperative purchase of raw materials and the cooperative sale of the finished products; credit institutions and similar organisations for the development and maintenance of the industry. All these artist crafts could be carried on as home industries or by productive cooperative societies. Under able business management, the prospects are most hopeful, and employment could be provided for many thousands of persons.

Within a brief period a start might be made in the following branches of artist craftmanship:

Silver filigree work, plain, encrusted or set with stones.

Brassware of the Damascus pattern, with copper and silver inlays.

Brass founding and Zinc founding, rough finished wares, toys, etc.

Metal wares made with stamps, dies, and on the lathe. Rough finished articles, artistic bindings for furniture, etc.

Etching and Wood Engraving.

Galvano-plasty for table ware, jewelry, etc.

Stone-polishing for the production of various articles, from local varieties of marble, malachite, etc.

The Cutting of Diamonds and other precious stones, the work being done upon imported stones. There was at one time a diamond cutting business in Jerusalem, and it is supposed to have paid its way.

Carving of Small Objects in Ivory and Metal. Jewelry, bas-reliefs, etc.

Carving in Stone, Bone, and Wood. As inlays for jewelry, furniture, etc.

Wood Encrustations for furniture, boxes, etc.

Fancy Furniture both in the European and in the Damascene styles.

Fig. 17

Fig. 17
RIVER ARNON NEAR ITS EMBOUCHURE INTO THE DEAD SEA

Most of the rivers and wadis of Transjordania traverse steep and deep ravines which, by means of dams, could readily be converted into huge reservoirs for rain water.

Fig. 18
OUTFLOW OF THE SPRING LEDAN NEAR TEL-EL-KADI

The three principal sources of the Jordan, Hazbain, Bania, and Ledan, unite in the marshy plain of Hule and flow to the waters of Merom. Thence to the Sea of Tiberias, the Jordan conveys from 18 to 30 m^3 of water per second, running for 9 km. through a steep ravine with a total fall of 200m. Here an electric power station furnishing a horsepower of from 30,000 to 40,000 could be established. (op. cit.)

Fig. 18

Fig. 19

Fig. 19

THE JORDAN NOT FAR FROM JERICHO

In these reaches the Jordan could supply for irrigation purposes from 40 to 50 m^3 of water per second. (op. cit.)

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Fig. 20

RIVER JABBOK

This river, one of the eastern tributaries of the Jordan, can supply for irrigation purposes from 2 to 3 m^3 of water per second. (op. cit.)

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Fig. 20

Cane Furniture. This has a great vogue in the east.
Enamel Work in metal and silver.
Porcelain Painting.
Terracotta Ware.
Plaster Casts.
Mother of Pearl and Amber Articles.
Leather Work, stamped, etc.
Stuff dyeing.
Plush Work.
Carpets, woollen and silken. This industry was developed by Bezalel. In his day it occupied as many as one hundred and fifty workmen. The industry might be extensively developed.
Lace and Embroideries in silk, silver, etc.
Papier Maché boxes and other articles, lacquered and painted.

11. PRINTING & BOOKBINDING. There is a great field in the Holy Land for the development of these industries. Printing and bookbinding establishments, founded in Jerusalem for the production of prayerbooks and copies of the sacred writings, would doubtless be able to challenge competition throughout the world. The scripture bearing the imprint „Jerusalem" would be especially valued by the Jews of the dispersion, and would thus find a universal market. Educational developments and the effective revival of the Hebrew tongue will require a large number of new books. Palestine, as the spiritual centre of Jewry, will have to issue a number of periodicals. Industrial developments will necessitate the printing of much advertising matter. Printing and bookbinding, lithography, and other polygraphic industries and the making of cardboard, might become thriving industries, giving employment to thousands of workers.

12. THE WOODEN FURNITURE INDUSTRY is pursued in Palestine as a handicraft. The artistic furniture annually turned out in Damascus is valued at from frs. 300,000 to frs. 400,000. There is a large power-driven factory in Beyrout. A great deal of Austrian bent-wood furniture is used in Syria, the annual imports by way of Jaffa and Haifa being valued at frs. 150,000 and those by way of Beyrout at frs. 250,000. The Egyptian imports of bent-wood furniture have an estimated value of frs. 2,000,000. Bent-wood furniture has shown itself well-suited to the climate, and satisfies popular demand. As the Jewish population increases, there will be a greatly enhanced demand for furniture of all kinds. This branch of industry could indubitably be extensively developed. Under expert management furniture could be made for export to adjoining countries. This would provide employment for many hundreds of persons.

13. IRON FURNITURE and iron bedsteads especially, to an annual value of frs. 300,000 enters Syria by way of Jaffa and

Beyrout, and is imported into Egypt to a value of more than frs. 2,000,000. Such furniture is exceedingly well suited to oriental requirements. In Poland (Warsaw) large numbers of Jews are occupied in the iron furniture industry and as immigrants to Palestine, could assist in its development there. Attempts have already been made to manufacture various kinds of iron furniture in Palestine. There was a market for the goods, but they were made in so primitive a fashion, were so bad and so dear, that the enterprise had to be abandoned. There can be no doubt that, thoroughly modernised, this industry would thrive in Palestine, and that there would be a good market for its products.

14. IRON & STEEL WORKS. With businesslike management it would be easy in Palestine to manufacture metal incrustations, locks, agricultural and building tools etc. The forging of knives, swords and so on, in fact the production of metallic apparatus of all kinds, are industries which might furnish employment for hundreds.

It would lead us too far afield to enumerate here all the branches of small-scale industry, and at this juncture, when political and other conditions are still in a state of flux, it would be unduly venturesome to attempt a definite judgment concerning developmental possibilities. It is quite likely that in addition to the articles previously mentioned, a number of others, such as clocks and watches, gramaphones, surgical and optical instruments, various instruments of precision, sewing machines, adding machines, typewriters, lamps, toys, brushes and combs, fancy goods, pins and needles, buckles, knives, forks, and spoons, etc. etc. — in a word all such articles for whose manufacture the local procurability of raw materials is comparatively unimportant and upon which freightage is inconsiderable — could be manufactured in Palestine for the world market, thus providing employment for many thousands of persons. But for the fulfilment of these possibilities it is essential that the enterprises should be managed in a thoroughly businesslike way. Not merely must there be at the head of such undertakings experienced men perfectly conversant with the world market. Highly skilled workmen and persons with sufficient organising capacity are likewise requisite. Thus alone could a market be secured, thus alone could goods able to challenge competition be produced, and thus alone could the taste of consumers in various countries be duly considered.

CHAPTER VI.

MEANS OF COMMUNICATIONS

During the war the railway system of Palestine has undergone considerable expansion, but quite a number of railway lines, some of these being of normal gauge and others being light railways, are still merely projected and await construction in the immediate future. The railways now existing in Palestine and in the vicinity consist of the following lines:

	kilometres
Haifa, Ludd, Gaza, Kantara (normal gauge)	415
Belah, Beer-Sheba	50
Jaffa, Ludd, Jerusalem (partly narrow gauge)	89
Wady, Sarar, Beer-Sheba (narrow gauge)	80
Tine, Bethany, and Esned-Kudj	52
Haifa, Afuleh, Deraa (light railway)	164
Belad-El, Scheich, Acre	17
Afuleh, Jenin, Tul-Keram (light railway)	80
Massudje, Nablus	15
Deraa, Damascus, 137 kilometres Deraa, Maa, 323 kilometres	450
Totals	1,422

The projected railways are the following:

(a) Haifa-Rayak to connect the normal gauge Cairo-Haifa railway with the Rayak-Constantinople line. According to the draft scheme and in completion of the preliminary work undertaken by Meissner Pasha, the line will run via Tiberias, Rosh-Pina, Metula, and Saghbin to Rayak. The new line will be two hundred and fifty kilometres in length.

(b) The projected Cairo-Bagdad railway a normal gauge line more than one thousand kilometres in length, will cross Palestine, about one fourth of the new line being within the limits of that country. A connection with the Palestinian system is to be effected from Akabah. The last-named extension will be of enormous importance to Palestinian trade with Persia and India and to the development of Palestinian industry.

(c) Haifa-Acre. This line, seventeen kilometres in length, destroyed during the war, is to be constructed, and is to be continued along the coast for one hundred and twenty kilometres to Sur (Tyre) Saida (Sidon) and Beyrout.

Dock construction in Haifa is now under consideration. According to an earlier plan a breakwater twelve hundred metres in length, was to have been constructed, providing an anchorage with an area of from thirty to forty hectares. The costs of construction were estimated at from frs. 15,000,000 to frs. 20,000,000. According to more recent designs, whose execution will be far costlier, the anchorage is to be considerably greater.

With the development of the country and its increase in population there will be a notable expansion in light railways or narrow gauge railways. Before the war a light railway had been projected to connect Katrah, Petach-Tikva, Sarona, Jaffa and Rishon. Such a line could count on a annual freightage of fifty thousand tons, and would pay very well. If prolonged to Rehoboth and supplemented by branch lines, it might even secure an annual freightage of eighty thousand tons. Another line, of a total length exceeding one hundred kilometres, running from Jerusalem by way of Jericho and Salt to Amman, with a branch to the Dead Sea would serve to carry grain and charcoal, and ultimately also salt, gypsum, phosphates, etc. from Transjordania to the west, and should prove lucrative. The inauguration of great irrigation works and the practice of intensive agriculture would necessitate much additional light railway construction, above all in the Jordan valley.

In the near future new high roads will prove absolutely essential to the development of the country. At the present time the main roads of Palestine have a length of nearly one thousand kilometres, but they are for the most part unfinished or in exceedingly bad condition. No long time can elapse before it will prove necessary to build additional roads extending over two thousand kilometres or more. All these roads, old and new alike, will have to be highways of the first class and suitable for motor traffic.

For proper railway development in Palestine the colonisation of the country must be deliberately undertaken and must be entrusted to a Jewish Sociaty for the Colonisation and Reconstruction of Palestine. Only such a society would be competent,

by the fixing of freights, to encourage production in various parts of the country, and to secure labour suitable for constructing and working the railways.

With regard to the numbers of the railway staff, the following data of the staff on the Hedjaz railway and on the Jaffa-Jerusalem railway will give some idea of what will be requisite. The figures relate to the years just before the war.

	Hedjaz Railway 1600 kms.		Jaffa-Jerusalem Railway 87 kms.	
1. Management: Engineers and assistants . . .	35	100	—	10
Bookkeeping etc	50		—	
Medical service	15		—	
2. Train Service: Guards and brakesmen . . .	180	380	20	40
Station staffs	200		20	
3. Traction service: Locomotive Engineers and firemen	160	1060	20	80
Workshop and goodsyard hands	800		60	
Pump hands and oilers . .	100		—	
4. Line Supervision: District managers and assistants	100	600	10	50
Platelayers, labourers etc.	500		40	
Total	2,040		180	
or per kilometre	1.5 men		2 men	

It must of course, be noted that the numbers of the staff do not depend solely upon the length of the line, but must vary also with the frequency of the train service and the weight of the trains.

CHAPTER VII.

IRRIGATION WORKS

A carefully designed irrigation system is of the first importance to the development of the country and to the encouragement of agriculture. In the vilayet of Damascus, for example, suitable irrigation, despite the antiquated methods employed, has served to convert what was practically desert into a fertile and flourishing region, able to support a population of one million. In addition to the electrical station of Tekoa, nearly four hundred water mills are driven by the waters of the irrigation service. Branching out into a network of canals, the waters are utilised wholly for irrigation purposes, so that in the dry season not a drop runs to waste in the swampy lakes of Baret-el Ateihe. The slime from the irrigation waters and the sewage of the great city simultaneously irrigate and manure all the environs. The rivers of Palestine should be utilised in a similar manner, but with more modern appliances. As a result of certain measurements and observations I estimate the mean available waters of Palestine during the summer months as follows:

	cubic metres per second
The Jordan, the main stream with its tributaries . .	40 — 50
The Auja (about 8 c. m. and the other rivers flowing seawards, together with the lesser streams of the inland region)	15 — 25
The eastern tributaries of the Dead Sea	2 — 3
By regulating the marshy lakes and the stagnant waters of the rivers near the coast, by draining the marshes, and from springs near the coast, the water obtainable may be estimated at from	13 — 22
Total	70 —100

For the irrigation of one hectare 0.5 to 0.7 of a litre of water per second is requisite. A continuous supply of this quantity by day and by night during an irrigation period of from one hundred and fifty to one hundred and eighty days, represents covering the land with a depth of water ranging from seven hun-

dred to eleven hundred millimetres. Taking the available quantity shown in the above table, namely seventy to one hundred cubic metres per second, it would be possible to irrigate from one hundred and twenty thousand to one hundred and seventy thousand hectares of land.

The estimated extent of the low-lying plains of Palestine is about four hundred thousand hectares, one third of this area belonging to the Jordan valley and about two-thirds to the coastal region and the plains of western Palestine. Irrigation on this scale would only be requisite for intensive culture, but were the scheme carried out, the region could be transformed into a fertile garden, providing food for millions of persons and supplying raw materials for various industries. One third only of these regions could be irrigated from the Palestinian waters at present available; the storage of rainwater would be necessary for the irrigation of the remainder. To this end, gigantic dams or barrages would have to be constructed in the mountains. Thus the water flowing down the ravines and wadis during the winter months could be stored up and devoted to irrigation of the plains in the summer. A great deal of land would have to be levelled, and the water from the mountain reservoirs would be conveyed wherever required by a vast system of canals. The large and steep ravines of Transjordania are well-adapted for works of the kind here proposed, and to convert these wadis into colossal reservoirs would not involve any loss of cultivable land. If up-to-date machinery and modern methods of work were employed, the cost of constructing the reservoirs would be comparatively small. In Colarado, six reservoirs with a storage capacity of five million two hundred thousand cubic metres were constructed at a cost of fourteen centimes per cubic metre of stored water; four other reservoirs in the same locality provided storage for two million cubic metres of water at a cost of ten centimes per cubic metre; twenty four reservoirs in the basin of the Cache le Poudre River had a storage capacity of one hundred and twenty-two million cubic metres, and the cost was actually less than three centimes per cubic metre — nothwithstanding the high wages paid in America.

Additional supplies of water could be secured by drainage of swamps and morasses, and by regulating the flow of the rivers. In the case of the Jordan, for instance, this might be effected in the Hule Plain, by lowering the level of the waters of Merom by means of an outflow canal. This plan was worked out during

the war in the fullest detail by Major Weidner. The water vaporised in the marshes (varying in the Jordan valley from seven to twenty-five millimetres per day, or seventy to two hundred and fifty cubic metres per hectare of evaporating surface) and the ground water of the morasses, having been pumped into reservoirs, could likewise be employed for irrigation. The extent of the marsh lands of Palestine is estimated at twenty five thousand hectares, one fourth of this area being on the coast, one fourth in the Hule Plain, more than one fourth among the inland marshes in the Plains of Asochis and Esdrælon, in Beisân, Blecha, Genezareth and other parts of the Jordan valley, and nearly one fourth at Rohr-el-Safi in the southern part of the Dead Sea region. The cost of drainage is usually supposed to range between frs. 100 and frs. 400 per hectare. If the drainage operations are to be carried out by Jewish labourers, it is absolutely essential that up-to-date mechanical applicances should be employed were it only for the reason that in an unhealthy climate the number of employees must be restricted as greatly as possible, in order that they may receive specially high wages. The same point of view has to be considered in connection with the irrigation works, and here American experience can guide us.

In America the usal cost of installing irrigation works is about frs. 115 per hectare; in the state of California it is frs. 166 per hectare; the maximum cost is reached in Arizona, where it is frs. 314 per hectare of irrigated land. These figures can give some idea of the probable cost of irrigation works in Palestine. Irrigation is expensive when springs are used as the source of supply, costing on the average from frs. 2000 to frs. 3000 per hectare. The irrigation works on the Odgeha cost frs. 500 per hectare of irrigated land. We see therefore, that it would hardly be practicable to utilise springs as a source of supply in great irrigations schemes for the cultivation of the less valuable plants (hay, cereals, etc.).

Theoretically the rivers of Palestine can supply an energy of five hundred thousand horsepower, but the energy practically available from this source is not more than about one hundred horsepower. The Jordan and its tributaries are our chief concern in this connection, but the Odgeha and the other rivers flowing into the Mediterranean, and also the mountain torrents of the Dead Sea region, might become of great importance in the supply of energy for local purposes. Used as a source of electric power, this energy might be made available

Fig. 21

WATER ENGINE IN AN ORANGE GROVE NEAR JAFFA

The figure illustrates the method of irrigation commonly employed in the Arab orange groves. Water is obtainable everywhere in the coastal regions, where there is a sandy water-bearing stratum beneath the surface of the ground. An open well can supply from 10 to 30 m^3 of water per hour. Through a deep filter from 20 to 40 m^3 per hour can be pumped up. (op. cit.)

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Fig. 22

WATER WHEEL IN HAMA ON THE RIVER ORONTES

The wheel is turned by the river current, and in buckets attached to the periphery of the wheel water is raised into the aqueduct, whereby it is conveyed to distant gardens for irrigation purposes. (op. cit.)

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Fig. 22

Fig. 23

Fig. 23
BUILDING OPERATIONS IN PALESTINE

The building is effected with hardly any scafolding and almost without appliances. The mortar is for the most part prepared from slaked lime mixed with ordinary earth, in order to economise water and owing to the local scarcity of sand. (op. cit.)

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Fig. 24
ANTIQUATED BUILDING METHODS

Building after the manner shown in the illustration can only be made to pay by the utilisation of the cheap labour of women and children. For the employment of Jewish workmen in this industry to be possible, up-to-date methods, machinery and appliances must be utilised. (op. cit.)

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Fig. 24

in connection with the irrigation of high-level cultivable areas; it could be used for tramways, for illuminating purposes, in the manufacture of nitrogenous manures, and for various agricultural purposes; it could be turned to account in a number of industrial enterprises. In these ways it would effectively contribute to the development of industry and agriculture. Electrical developments are, in fact, closely interconnected with the possibilities for a general advance in Palestine, with those of an increase in population and of intensive agriculture. For the settlement of the Jordan valley by Jews, electric mountain railways would prove useful, enabling the settlers to reside in cool and healthy hill stations, the electric railways supplying easy communication with the low lying and hot valley regions. It seems probable that the returns from agriculture from irrigated land in the Jordan valley would more than suffice to repay the cost of such installations.

CHAPTER VIII.

THE BUILDING INDUSTRY

The imminent settling of the country by a mass of Jewish immigrants will lead to a great extension of building operations. Hundreds of new colonies will be established; existing towns will be enlarged by the addition of new quarters; and entirely new towns will spring up. When we remember that from three hundred to six hundred labour days are requisite for the construction of the simplest habitation, we shall begin to realise the enormous amount of labour that will be requisite to cope with the new developments.

Moreover, every town will require public buildings for educative, scientific, and artistic purposes; synagogues, theatres, hospitals, public offices, and various other buildings used for purposes of communal utility. In addition, the resettlement of the country will entail the building of private villas and mansions, of hotels and welfare institutes, of factories, work-shops etc. and the construction of these various edifices must be taken into account in estimating the demand for labour. This much is certain, that a vigorous building industry will be closely associated with the increasing development and advancing well-being of Palestine, and that occupation for many thousands of workmen, foremen, managers, and technicians will be found in this field of activity.

It is absolutely essential that modern appliances and methods should be introduced into the Palestinian building industry without delay, to enable houses to be constructed cheaply and expeditiously and to render possible the employment of the comparatively expensive Jewish labour. Due attention must be paid to the need that the houses should be at the same time tasteful and well suited to the climatic conditions. Especial stress must be laid upon the importance of modernising the quarrying industry. Men with experience in the American quarrying industry will be especially valuable as inspectors and foremen, to teach up-to-date methods.

CHAPTER IX.

DEVELOPMENTAL PROSPECTS

The foregoing survey of industry, handicraft, and commerce in Palestine will have shown that there is no prospect of the country's becoming in the near future one of the homes of large-scale industry. The natural qualities of the region and the peculiar mentality of the Jewish population are alike better fitted to promote the growth of small-scale industry. Industrial development in Palestine must be deliberately guided in conformity with these considerations. It would be hazardous to offer any general numerical statement regarding the amount of employment which Palestinian industry and commerce might provide when fully developed. Assuming, however, that in the course of the two ensuing decades the industrial population of Palestine increases by half a million, so that about one hundred and fifty thousand additional persons find employment in various occupations* it may be suggested that these persons will be occupied more or less as follows:

	First Decade	Second Decade
Large-scale industry, mining, various concessions	2,000 — 5,000	5,000 — 10,000
Small-scale industry, handicraft, and fishery	10,000 —30,000	30,000 —100,000
Communications; construction of railways, docks, and roads (staffing of same)	1,000 — 3,000	1,000 — 2,000
Irrigation works, construction and staffing	5,000 — 8,000	8,000 — 12,000
The building industry	1,000 — 2,000	2,000 — 4,000
	6,000 —12,000	14,000 — 32,000
Total	25,000 —60,000	60,000 —160,000

The table shows that most of the labour, or at any rate, from half to two thirds, is allotted to small-scale industry. Next in importance comes building, which is likely to absorb one

* The ratio of the actual workers to the total population among the Jews in Russia during the year 1910, was, in manufacturing industry 1—3.2; in agriculture 1—4.8.

fifth of the new labour, and it must be remembered that these workers are essentially handicraftsmen. It may be well to point out that whereas the development of large-scale industry, of communications, and building, has definite limits, small-scale industry, on the other hand, by the introduction of new branches and by the perfection and expansion of those already established, is, under good business management, susceptible of almost unrestricted growth, providing continually increasing opportunities for employment. For this reason, the development of small-scale industry on the lines suggested in Chap. V would seem to be of the greatest possible importance, and should not prove difficult if the work of colonisation be intelligently carried out.

One of the first requisites for the furtherance of industry and commerce in Palestine is the foundation of a bank with ample capital, a bank for commerce and industry. The aims of this institution should be, in the first place, to found great undertakings, such a those for the utilisation of all the water supplies of the country for irrigation and as sources of energy; the establishment of centres for overland trade; the foundation of enterprises for town lighting; tramway and railway development, the building of docks; the encouragement of mining enterprise; the promotion of companies to carry on the various industries suitable for the country. The bank will have to help in securing the necessary concessions, and must attract from other countries the capital requisite for Palestinian development, while carefully avoiding the encouragement of unduly speculative enterprises. In the second place, it will be the great and difficult task of the bank to promote the development of small-scale industries and handicrafts, since these are to be the mainstay of the future industrial development of the country. The future will show whether small-scale industries will develop along the lines suggested in Chapter IV. In any case, these developments must be very carefully planned.

The next requirement is an improvement in transport conditions to facilitate the import of the principal raw materials for the developing industries and the export of the products, and to put an end to the evils prevailing to-day, when inland transport over quite a brief stretch is often costlier then marine transport for several thousand miles. A steam navigation company must be founded, or in default of this, special agreements must be made as to freights with the existing steamship lines. Of primary importance are the proper development of the Pales-

tinian railway system and the prolongation of the local railway lines to effect junctions with neighbouring systems, so that favourable tariffs may be obtained for the transport of various goods. These railway enterprises must be undertaken by the Jewish Society for the Colonisation and Reconstruction of Palestine for only upon this condition will the work of colonisation be carried out methodically in such a way as to further the development of industry and agriculture, while under these auspices the railway construction works and the staffing of the railways will from the very first provide employment for thousands of the new settlers.

For the facilitation of transport, high roads must be built throughout the country, roads good enough for motor traffic as well as for other wheeled vehicles. Great storehouses must be constructed, with silos for cereals and cold storage for perishable goods. At the same time care must be taken to encourage the supply of such raw materials as are requisite for the new Palestinian industries. Those not procurable locally and the necessary exotic foodstuffs in addition, must be obtained in sufficient quantities and at advantageous prices from the best sources of supply and stored in the warehouses. These warehouses will serve also for the storage of goods for export. Extremely valuable institutions will be (1) a museum for commerce and industry displaying all the products manufactured in the east, showing the raw materials from which these are made and the most modern appliances used in their manufacture and (2) a laboratory for the chemical and technical study of raw materials, building materials, etc.

A technical school with a commercial section would help greatly in the promotion of industrial development. This institution must not have a purely European curriculum such as was planned for the proposed technical institute in Haifa, which was to concern itself almost exclusively with teaching machine construction and design, and similar matters. The technical school must be adapted to the peculiar requirements of Syria and the east. The pupils should receive such a training, including a knowledge of the requisite languages, as will enable them to secure occupation in Palestine and elsewhere in the east. Gaining a sure footing in the labour market and the goods market of the orient, the ex-students of the technical school could contribute powerfully to the diffusion of Palestinian manufactures in adjoining countries. The plans of the Haifa technical institute must be modified in this sense, so that the place may afford

really practical assistance in the development of Palestinian industry.

Many difficulties will have to be overcome before the industries of Palestine can be effectively developed with the aid of Jewish settlers. By the lack of uniformity in the country, no less than by the lack of uniformity among the proposed immigrants, so many complications are introduced that the most careful study of the problem in all its details is absolutely indispensable. More harm than good will result if we approach the undertaking with nothing better than the rule of thumb methods that have often characterised earlier colonisation schemes.

For example, in establishing an irrigation system to provide a region hitherto desert with the water that shall give it life, we must never fail to bear in mind the need for taking precautions to prevent the spread of malarial fever. Particularly does this apply to the construction of reservoirs for the storage of rainwater.

Again, whilst the Jewish settlers may appear at the first glance to be socialistically and communistically inclined, it must never be forgotten that in essence the Jews are extremely individualistic, and are as yet comparatively ill adapted for communal life. It must further be remembered that the various foreign ideas which the Jews of the dispersion have of late acquired are in many respects little more than a gloss. Established in a country of their own, and given opportunities for free development, the Jews will speedily be found to aspire towards civic independence and the cultivation of personal individuality.

The complex and manifold peculiarities of the country and its inhabitants, present and prospective, must be elaborately studied and must be allowed for with sedulous attention. Errors of judgment on the part of the leaders in the colonisation scheme might easily result in making many of the peculiarities of the settlers prove disastrous qualities. The greatest possible stress must therefore be laid upon the importance of caution, foresight, and thoroughly efficient organisation, in order that the seed may fall upon good ground. Then the wonderful possibilities of the country and the people may be turned to full account. Then, we may hope, Palestine will become the garden of the world.

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